

2. Pre-Feasibility Study for the Development of Passenger Landing Facility along the Nile/Nile River Environment

2.1 Introduction

This section discusses the pre-feasibility study for tourism facilities improvement recommended as one of the projects constituting Upper Nile Tourism development program. In addition, an implementation program for environmental management of [Nile cruises](#) is included in this study considering their impact on the Nile environment.

2.1.1 Study Area

The study area focusing on cruise tourism in Upper Nile is the Nile River and Lake Nasser spanning the three governorates of Qena, Luxor, and Aswan, as shown in Figure 2.1.

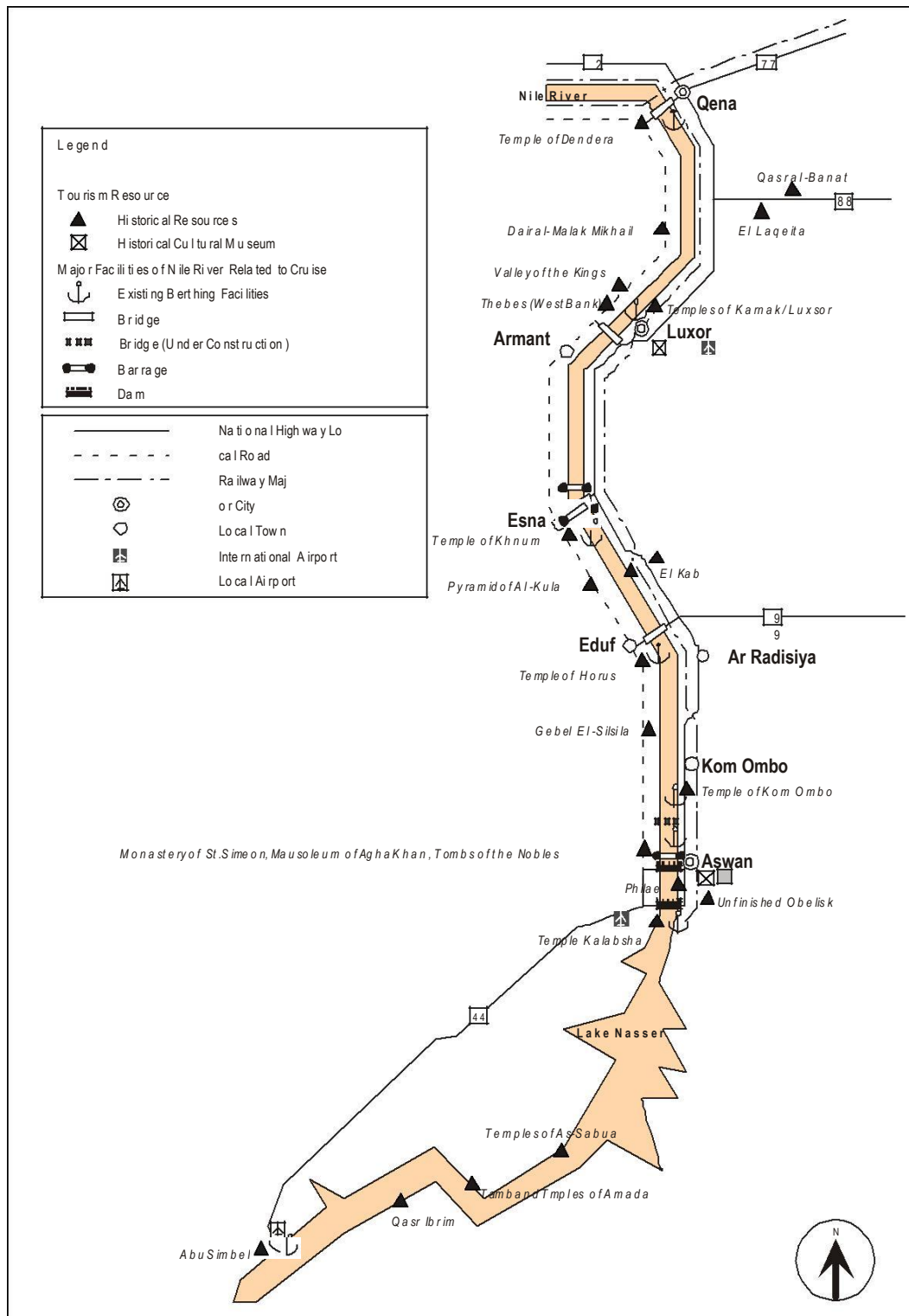
2.1.2 Objectives of the Study

This pre-feasibility study is limited to investigating the possibility of berth facilities improvement and new development for cruise tourism in the Upper Nile sub-region. This study is also based on previous study results and some assumptions owing to limits of data information and time frame. It is understood that obviously it will be necessary to amend a part of this study in the further study with detailed engineering.

The objectives of the study are as follows:

- To define a long-term strategy for the cruise tourism in conjunction with the regional tourism development plan;
- To review previous studies related to cruise tourism in the study area;
- To analyze the possibility of improvement and development of berth facilities for cruise ships in the study area;
- To prepare a berth facilities improvement plan including implementation program and institutional framework; and
- To prepare an implementation program for the [Nile cruise](#) environmental management.

Figure 2.1 Location Map of the Study Area



Source: JICA Study Team

2.2 Background and Rationale of the Study

Egyptian tourism is one of the rapidly growing sectors of the Egyptian economy. One of the most attractive tourism products of Upper Nile is cruise tour on the Nile River and part of Lake Nasser. But it has been indicated and discussed also that great numbers of cruising ships in Upper Nile have given rise to problems concerning convenience of tourist services, deterioration of environment and safety of cruise tours. Following is a general overview of the existing conditions and issues based on previous studies and field surveys by the JICA Study Team, and the justification of the study.

2.2.1 Overview of Cruise Tourism in the Upper Nile Sub-region

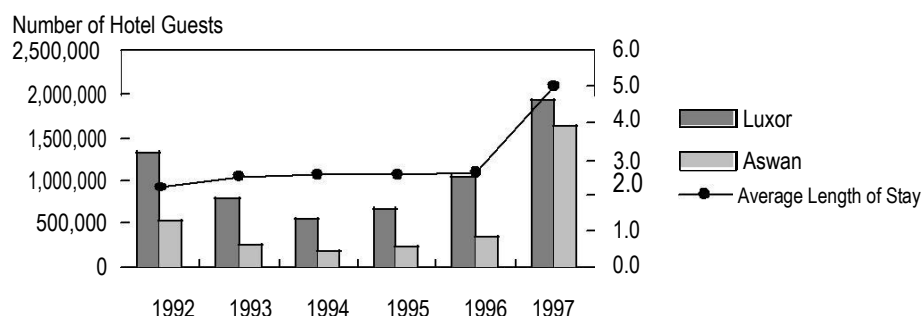
The second largest number of tourists (0.7 million) enjoy classical tourism in the Nile Valley with its famous world heritage sites and cruise tour at the heart of world civilization along the Nile River, although recent government policy has been oriented towards diversifying Egyptian tourism products, such as marine resort product in the Red Sea, which topped the majority of international tourists (0.9 million).

(1) Tourism trend of Upper Nile

The growth of tourists to Upper Nile has been unstable in the last 8 years owing largely to political reasons, such as the Luxor incident in 1997. After this incident, the number of tourist arrivals dropped drastically in 1998, but was revived in 1999 and almost exceeded pre-Luxor tourist numbers. Major trend of Upper Nile tourism is summarized as follows.

- The growth of hotel guests in Upper Nile has re-started at the latter part of 1994, and big annual average growth rate of Aswan (75%) has contributed greatly to the revival of classical tourism in comparison with Luxor (35%);
- Average length of stay in the region is 5.0 days longer than the previous year's 2.6 days;
- Tourists to Upper Nile have not changed their travel pattern, visiting two major destinations either in Luxor City or Aswan City to see temples or travel by air to Abu Simbel, or join the [Nile cruise](#) and visit Esna, Eudf, Kom Ombo temples;
- Tourists mainly visit Upper Nile during summer and winter;
- After the Luxor incident, the Nile cruise, which is a popular product of the Nile Valley, once again have begun to draw international tourists, mostly from Europe; and
- In spite of some new tourism investment on cruise ships and inland accommodation development, the scale of new investments lags behind the large hotel investment in the Red Sea.

Figure 2.2 Number of Tourist Arrivals in Upper Nile



Note: Length of stay in Upper Nile is the average number of hotel guests of Luxor and Aswan

Source: Tourism in Figures annual issues by MOT

(2) Nile Cruise tourism

Cruise tourism is not only a major product of the Nile Valley but also a dominant player of regional accommodation capacity. In spite of this, the growth of rooms (cabins) has been quite

slow as indicated by a mere 3.2% annual average growth rate in 8 years. Although basic statistics on the number of Nile cruise tourists has not been established, existing conditions are summarized as follows:

- [Nile cruises](#) between Luxor and Aswan is the dominant tour program being offered by major tour agents and operators worldwide. Another cruise tour, the Lake Nasser cruise, has been dealt as optional tour;
- 214 ships on the Nile River including Cairo, Luxor, Aswan, Lake Nasser (3 ships) and the Red Sea area were in operation in 1997, or a share of 60% of total accommodation capacity in the Upper Nile sub-region;
- Cruise ships are mostly classified as 4- to 5-star accommodation, but some international travel agents have indicated several problems about their standard and maintenance, which are below that of a high-rated hotel;
- Each ship has an average of 50 cabins (rooms), operates 3- to 4-day cruises (one-way voyage) or 6- to 7-day cruises (two-way voyage);
- 75% of international tourists staying in ships are Europeans (questionnaire survey in 1991), and are disposed to spending and enjoying the voyage itself most of the time with some visits to antiquities along the Nile River; and
- The three major cruise ship operators are (a) International hotel chain groups (Hilton, Sheraton, Accor group, etc), (b) Tour operators or travel agents (Misr Travel Co, Travaco, etc), and (c) Other companies or individual owners (EGOTH Co., Presidential Co., etc).

Table 2.1 Number of Cruise ships and their Cabins by Year

	1991	1992	1993	1994	1995	1996	1997	1998
Cruise ship	169	181	188	205	206	215	214	216
Cabins	8,584	9,297	9,763	10,339	10,532	11,184	11,322	11,075
Cabins per ship	50.7	51.4	51.9	50.4	51.1	52.0	52.9	51.3
Room share of total region (%)	59.4	59.7	60.3	60.8	60.3	60.9	60.4	61.8

Note: Total number includes areas of Cairo, Luxor, Aswan, Lake Nasser, and the Red Sea
Data in 1998 have not been published.

Source: Tourism in Figures annual issues by MOT

2.2.2 Significance and Justification of the Study

(1) Cruise tourism as an essential product of Upper Nile

Cruise tourism plays the most important role in Upper Nile tourism, from the viewpoint of not only accommodation function (60% of the total capacity of Upper Nile in 1997), but also as the most popular tourism product being offered by a great number of travel agents worldwide. The following are identified as points of product character:

- A traditional tourism product on the Nile River famous for its nostalgic , cultural tourism;
- One of the most attractive transportation modes for sightseeing of antiquities along the Nile River and Lake Nasser and to enjoy the atmosphere of the Nile Valley; and
- Advantageous accommodation facility development in terms of investment efficiency.

(2) Role and function for cruise tourism facilities improvement

In order to cope with the disadvantages of cruise tourism facilities including cruise ships as identified in the preceding section, it shall be necessary that the government support and assume responsibility for the provision of public facilities and infrastructure, even major ones.

On the other hand, the endangered environment of the Nile River and Lake Nasser should be protected by several measures. Urgent action needs to be taken for its physical protection and improvement.

The roles of this project are identified in Table 2.2. In order to meet the requirements for cruise tourism improvement, the project should have the following functions:

- To consolidate the Nile tourism development as a major product of Upper Nile in terms of securing convenient and safe use of cruise accommodation and other water recreational facilities;
- To support adequate management development of water transportation in terms of achieving efficient service and smooth operation of river tourism;
- To formulate attractive and comfortable environment of waterfront area as a base for historical tourism and recreational tourism of the Nile River; and
- To prevent cruise tourism development from deteriorating the environment of the Nile River and Lake Nasser.

Table 2.2 Roles and Functions for Cruise Tourism Facilities Improvement

Role of improvement	Function of Cruise Tourism Product			
	Accommodation facilities	Water transportation	Visitor facilitation	Environment awareness
Convenient and safe use of facilities				-
Efficient and well-organized service and operation				
Attractive and comfortable environment creation				
Mitigation of natural environmental impacts				

Note: = the most important factor, = secondary factor, — = no relation

Source: JICA Study Team

2.3 Existing Conditions and Issues on Cruise Tourism Facilities Improvement and its Environmental Management in Upper Nile

2.3.1 Existing Conditions of Facilities for Cruise Tourism

(1) Berth facilities

Berth facilities along the Nile River and Lake Nasser can be classified in terms of their function and role, as follows:

Major station berth (MSB)

It is located in front of gateway cities and connected to the international airport, major hotels and cruise ships' utility service systems, such as water and fuel supply, sewerage and solid waste collection.

Landing berth (LB)

It serves as landing place for sightseeing of antiquities or other attractions.

Other berths or piers (OB)

It serves various boats and vessels, such as ferryboats, recreational boats "Felucca" and taxi boats.

Table 2.3 Classification of Existing Berth facilities

Cruise destination	Function		
	MSB	LB	OB
Dendera	-	*	-
Qena	-	**	-
Luxor		-	
Esna	-		-
Eduf	-		-
Kom Ombo	-		-
Aswan		-	
Aswan High Dam	***	-	-
Abu Simbel	-		-

Note: *Dendera berth facilities have been limited to utility service (water and fuel supply).

**Utilities are under construction in Qena new berth facilities.

*** These berth facilities are not identified in

detail. Source: JICA Study Team

According to a recent study by TDA (University of Cairo), berth facilities have been managed and operated by public and private organizations. Public berth facilities are disposed to locate on rural area with historical destinations in front of antiquities, while private facilities concentrate on the major gateway cities of Luxor and Aswan. As it is obvious that the total number of berthing lots, as shown in the following table, indicates a lack of capacity in comparison with the number of ships, it has been observed in the field survey that there are multi-parallel berthing (2-5 lines parallel to the first ship) in many berthing lots.

Table 2.4 Berth facilities in Operation, 1999

Destination	Number of Existing Berths			Ferry berth	Under construction
	Public	Private	Total		
Qena	2	0	2	0	1
Luxor	37	17	54	3	4
Esna	13	1	14	0	0
Eduf	3	1	4	0	0
Kom Ombo	6	0	6	0	0
Aswan	38(4)*	4(38)*	42	2	0
Aswan High Dam	**		-	**	-
Abu Simbel	**		-	-	-
Total	65	57	122	5	5

Note: * This figure indicates a big gap between the study above and a previous study in 1991 and field survey in August, 1999 by JICA Study Team.

** These berth facilities are not identified in detail.

Source: Indicative Plan for the Nile Cruise Berth between Aswan and Cairo by TDA-Cairo University

Table 2.5 Berth facilities Conditions between Qena and Aswan, 1999

Category	Facilities	Qena		Luxor	Qena	Aswan		
		Dendera	Quena	Luxor	Esna	Eduf	Kom Ombo	Aswan
Basic facilities	Embankment (km)	0.1	1.2	3.5	1.3	0.8	0.5	3.0
	Lighting							
	Steps	1	-	4	4	4	3	
	Ferry for local communities	-	-	1	-	-	-	1
	Pier for local ship	-	-	5	-	-	-	-
Utility services	Water Intake	1	-	4	-	2	-	
	Sewerage Intake	-	-		-	-	-	-
	Waste Disposal System	-	-		-	-	-	
	Fuel Supply	1	-		-	-	-	
Security services	Police Station	-	-	1	-	1	-	-
	Police Allocation(person)	-	14	13	8	8	6	
	Fire Hydrant	-	-	6	-	2	-	
Tourist services facilities	International Telephone	-	-	2	-	-	2	
	Park or Rest Place	-			-	-	-	-
	Public Toilet	-	-	4	-	-	-	-
	Information Center	-	-	-	-	-	-	-
	Souvenir Shops/Kiosk	-	-	9(68)*	-	-	5-6**	
	Coffee Shops/Restaurant	-	-	-	-	-	-	
Transportation	Transportation (Coach)	-	-			-	-	-
	Bus/Taxi Parking site	-	-		-	-	-	-
	Transport Terminal	-	-	-	-	-	-	-
Plan & project	Berthing Expansion (km)	-	0.5	5.0			-	
	Utility Provision	-					-	
	Development Status	Closed/private	Public	Public/private	Public/private	Public/private	Public	Public/private

Note: * indicates vacant rooms for rent based on the field survey in August, 1999 by JICA Study Team.

** indicates temporary shops based on field survey in August, 1999 by JICA Study Team.

Source: JICA Study Team

(2) Other facilities related to cruise ships

Other facilities along the Nile River and Lake Nasser can be identified in terms of their navigational conditions, as follows:

Table 2.6 Other Facilities related to Cruise Ships

Destination	Surrounding facilities near destination			
	Barrage	Bridge	Dam	Ferry
Dendera	-		-	-
Qena	-		-	-
Luxor	-	-	-	
Esna	(2)		-	-
Eduf	-		-	-
Kom Ombo	-	-	-	-
Aswan	-	*	**	
Aswan High Dam	-	-	**	(port)
Abu Simbel	-	-	-	-

Note: *A new bridge is under construction.

**This dam functions as bridge for vehicles.

Source: JICA Study Team

2.3.2 Existing Plans and Projects for Upper Nile and Cruise Tourism

(1) Existing plans and programs

Several plans and programs have been prepared for Upper Nile in relation with tourism sector development from a region-wide to a town-wide level of development. The following table shows major plans and programs for this region, including those that lack detailed information or have insufficient data.

Table 2.7 Existing Development Plans and Programs in Upper Nile

Governorate	Location	Development related to Cruise Tourism	Reference, data source
Qena	Qena City	-	Development Scheme of South Egypt Plan
	Armant/Esna	-	Development Scheme of South Egypt Plan
	Armant	New Dockyard development	Qena Governorate Plan (Private sector investment)
Luxor	Luxor City	New Berth Development	Luxor City Development Plan by MHUUC-UNDP
	El Toad	-	El Zoraykat Island project
Aswan (Nile River)	Aswan City	-	Under study by MHUCC-UNDP
	Eduf City	New Berth Development	Aswan Governorate has a plan to develop tourist area.
	New Aswan City	New Bridge Construction	Under construction connecting to New Aswan City
		New Berth Development	Aswan New City Development Plan by MHUUC
Aswan (Lake Nasser)	Toshka		Toshka Tourism Development Plan by TDA
	Cruise Ship	Target number(5,000 ships)	Development Scheme of South Egypt Plan
Cruise ship	Cairo/Luxor/Aswan	Current investment plan	Under construction, Hotel Capacity in the Republic of Egypt 1999by TDA

Source: JICA Study Team

(2) Review of previous studies for Nile cruise development

There are three studies for [Nile cruise](#) development in past years including a brand new study in1999. Major topics in the studies can be summarized as follows:

A Priority Action Plan for Infrastructure and Tourism Development in Egypt Phase III 1991: Cruise Ship Tourism by Arthur D. Little and Ministry of Tourism

This feasibility study aims to formulate development plans for berth facilities with terms of reference in order to solve existing problems of [Nile cruise](#) tourism (it is not clear whether this plan has been implemented or not). Highlights of the study are as follows:

- Demand analysis projected the number of ships in the range of 506-831 ships and the additional number of berths required in the range of 4-26 berths in 2000;
- Proposed the improvement of visitor capacities of antiquities sites; and
- Proposed the formulation of institutional frameworks for river management programs such as river traffic, cruise ship operation and broad coordination among several agencies; and
- Exclusion of Lake Nasser cruise in the plan.

Private Sector Tourism Infrastructure and Environmental Management Projects: Staff Appraisal Report by World Bank in 1992

This report is for appraisal of the Bank's project loan by the private sector consisting of the Red Sea coastal zone management projects and [Nile cruise](#) improvement projects. These projects consist of the following components, but some of them, especially the Nile cruise navigationa l improvement seems not to have been implemented all:

- Infrastructure development of two integrated development sites (Abu Soma, Sahl

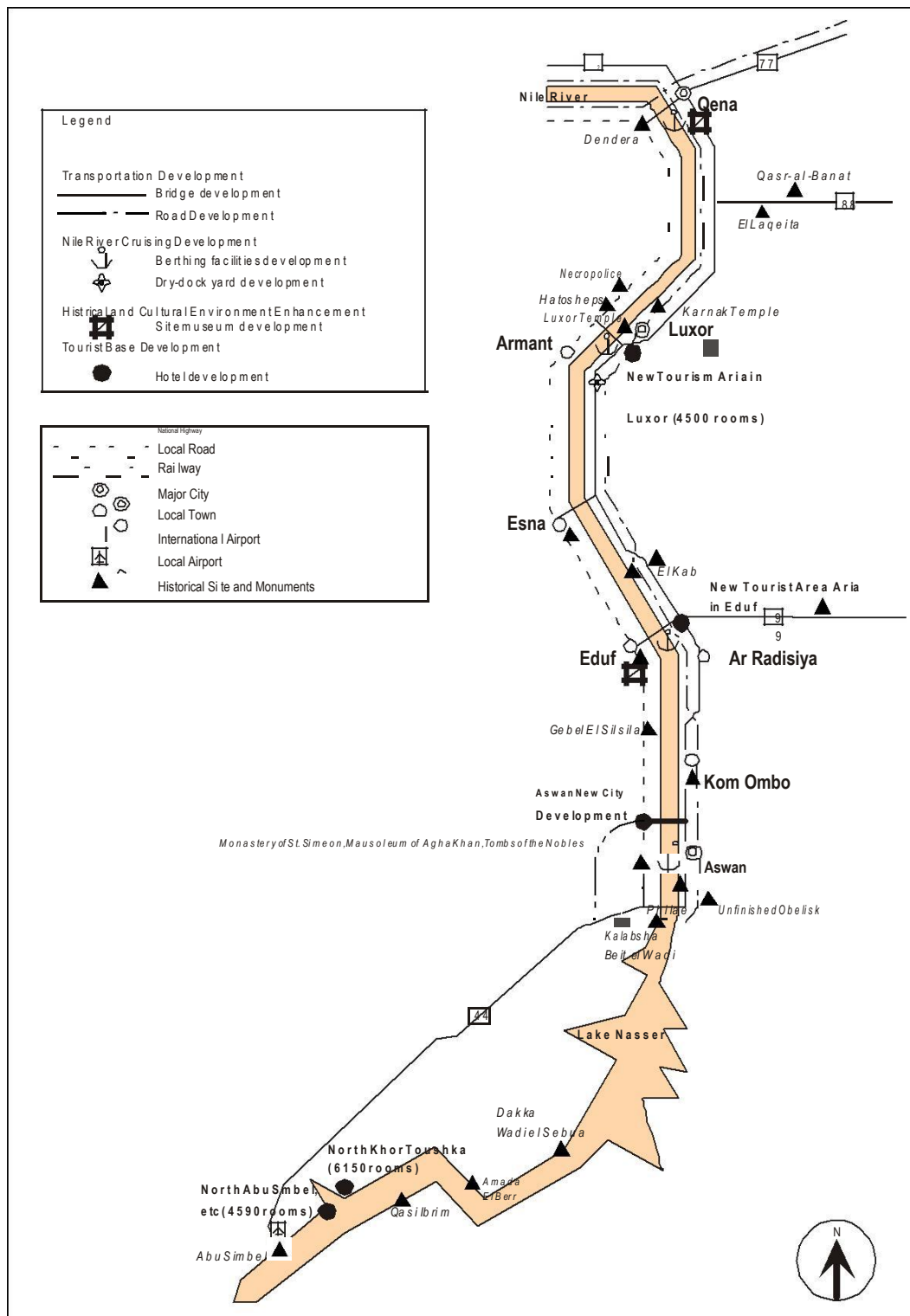
- Hasheesh);
- Provision of utility services by the private sector in the Red Sea coast;
- Construction of additional berth facilities for the [Nile cruise](#) by the private sector;
- Improvement of traffic and navigational facilities and access to tourist sites; and
- Development of coastal management plan under the auspices of GEF.

Indicative Plan for the [Nile Cruise](#) Berth between Aswan and Cairo by TDA in 1999

This report aims at formulating a master plan for the [Nile cruise](#) improvement projects from Cairo to Aswan. The project components presented below are similar to the two development projects mentioned above, and proposed to improve facilities and institutional system for traffic management and others:

- Analysis of berth facilities demand projected the number of possible berths in the range of 230-384 berths;
- Proposed the improvement of visitor capacities of antiquities sites;
- Proposed the formulation of institutional frameworks same as that proposed in the 1991 report; and
- Exclusion of Lake Nasser cruises in the plan.

Figure 2.3 Plans and Projects in Upper Nile



Source: JICA Study Team

2.3.3 Assessment of Berth facilities in Upper Nile

This section describes the constraints and opportunities of the existing berth facilities and the potential sites for future development. A general assessment was conducted based on the following criteria in order to improve and enforce the function and attractiveness of the [Nile cruise](#) tourism. Information of existing conditions of berth facilities is based on-site surveys and the report of Indicative Plan for the [Nile Cruise](#) Berth between Aswan and Cairo by TDA.

(1) Existing berth facilities

The criteria for assessment of each berth facilities area are itemized below, and the result of assessment by site is shown in Table 2.8.

Potentials

- Magnitude of importance in terms of number of visitors and attraction value added to berth facilities
- Existing and future function of hinterland in conjunction with berth facilities
- Desirable character and role to play in berth facilities (amenity creation, etc)

Berth facilities capacity

- Capacity of berth facilities to meet demand
- Existing facilities conditions and standard
- Facilities and other structures needed (embankment, utilities, visitor facilities)
- Navigational circumstance

Backyard capability

- Existing condition of visitor facilities (parking and traffic conditions)
- Facilities and other structures needed (embankment, utilities, visitor facilities)
- Adequate atmosphere (landscaping, walkway, etc)

Environmental consideration

- Scarcity or importance of natural environment (natural protectorate)
- Possible occurrence of natural hazard (erosion, flash flood, etc)
- Possibility of environmental pollution (inadequate industrial facilities, treatment facilities, etc)
- Landscape condition in terms of harmonization with surrounding environment

(2) Potential site for berth facilities development

On the other hand, several historic sites interspersed along the Nile River have the potential as new historic destinations to become part of the [Nile cruise tour](#). The introduction of new destinations could give the following benefits:

- Contribute to the diversification of historical tourism products;
- Contribute to the extension of length of stay;
- Mitigate problems of concentration at limited historical sites; and
- Increase berthing lots at various places in order to manage the operation of the [Nile cruises](#).

Table 2.8 Assessment of Existing Berth facilities and their Surroundings

		Potential	Berth Capacity	Backyard	Environmental Consideration	Remarks
Qena/ Luxor	Dendera	As temporary stopover for Dendera site	Difficult to expand Bad physical condition for berth	Conflict with local community	Sedimentation problem	Not permitted to use due to security problem
	Qena	As main access area for Dendera with future tourist resort	Possible to expand Necessary to add utility services	Affordable space for visitor services	Sedimentation problem	Qena Governorate plans to provide utility service and tourist facilities and hotels
	Luxor	As major berthing terminal with major gateway city of Luxor	Beyond capacity With full utility facilities	Good condition with attractive promenade	Floating solid waste problem	Municipality plans to develop new berth facilities in El Toad area
	Esna	As sub berthing terminal with tourist town of Esna	Beyond capacity in conflict with two barrages in operation No utility service	Congested urban area Insufficient tourist facilities	Not suitable urban landscape for historical site	Necessary to coordinate urban function and historical environment
Aswan (Nile River)	Eduf	As sub berthing terminal with tourist town of Eduf	Beyond capacity Unsuitable physical condition of river due to small islands No utility service	Tourist traffic congestion Insufficient tourist facilities	Not suitable urban landscape for historical site	Necessary to coordinate urban function and historical environment SCA plans to develop Esna site museum
	Kom Ombo	As sub berthing terminal with future tourist resort of Kom Ombo	Beyond capacity Unsuitable physical condition of river due to small islands No utility service	Conflict with the monument site Not enough area for service	Sedimentation problem Problem of embankment erosion	Necessary to expand berth area and to improve existing berth facilities
	Aswan	As major berthing terminal with major gateway city of Aswan	Beyond capacity Insufficient utility facilities	Problem of monopoly by private sector	Sedimentation problem	Necessary to open private use of the Nile to public use
Aswan (Lake Nasser)	Aswan High Dam port	As terminal only	Congestion with other ships	Unsuitable conditions for tourists	No information	Necessary to coordinate between cruise ships and commercial ships
	Kalabsha/Beit el Wadi	As stopover (the Island) As embarkation point (inland site)	No suitable landing facilities to the island of Kalabsha	Conflict with local fishing boats	Malodor problem from fishery factory	Necessary to develop new embarkation facilities apart from existing one
	Dakkah	As stopover	No suitable landing facilities	No information	Consideration of historical site	Necessary to develop safe berth facilities
	Amada	As stopover	No suitable landing facilities	No information	Consideration of historical site	Necessary to develop safe berth facilities
	Qasr Ibrim	As stopover	No suitable landing facilities	No information	Consideration of historical site	Necessary to develop safe berth facilities
	Abu Simbel	As stopover	Sedimentation problem	No information	Consideration of historical site	Necessary to improve existing berth facilities

Source: Indicative Plan for the Nile Cruise Berth between Aswan and Cairo by TDA and the field survey by JICA Study Team

The criteria for selection of potential site for new berth facilities can be itemized as follows (except engineering and environmental criteria to develop the facilities):

- Magnitude of attractiveness of historical sites for tourists;
- Appropriate distance of location from antiquity sites along the Nile River;
- Accessibility to monument sites in terms of adequate distance from the river bank; and,
- Suitability of environment of historical sites without any artificial obstacles.

Table 2.9 Evaluation of Potential Sites for Berth facilities Development

Candidate of new destination	Potential of site and its conditions				Total evaluation
	Attractiveness	Appropriate Interval	Accessibility	Suitable surroundings	
Naqada ruin	-		-		-
Dier el Marek-Tukh			-		
El Kab (tomb, ruins)					
Gebel el Silsila					

Note: = highest, = secondary, = not good or competitive, - = worst

Source: JICA Study Team

Based on the result of above evaluation, El Kab and Gebel el Silsila are proposed as new destinations and berth facilities can be developed in front of the sites.

2.3.4 Issues for the Cruise Tourism Improvement

The constraints and problems of cruise tourism on the Nile River and Lake Nasser presented in the aforementioned section should be tackled from the broad point of view with multi-sectoral cooperation. The issues are identified as follows:

(1) Issues for facilities improvement

Taking account of compatibility between future demand of cruise tourism and capacity of tourism development, berth facilities should be improved and developed in order to secure safe and comfortable environment for visitors. Major issues are shown below.

Berth facilities for cruise ships and other boats

- Expansion of capacity of berth facilities to normalize its use and meet demand;
- Upgrading of existing facilities standard in conjunction with backyard function, considering that land transportation is expected to grow as substitute measure absorbing future access demand to destinations;
- Introduction of construction measures to mitigate environmental impact;
- Development of new destinations with new berth facilities;
- Creation of attractive atmosphere of water-front area for visitors;
- Necessity of elaborate engineering study for a suitable berth facilities; and
- Adequate system for development and management of facilities among public and private sector taking account of both advantages to serve tourists and ship operation

Environmental impact of cruise ships and other boats

- Minimization of emission of environmental pollutants from ships;
- Installation of necessary system in order to process pollutants from ships; and
- Coordination with stakeholders, such as agricultural or existing communal areas, who are required to utilize berth facilities, and preparation of substitute measures or necessary compensation.

(2) Issues for cruise tourism management

To secure safe and comfortable cruises and other boats, operational management of river transportation is another important pillar that can be added to facilities improvement. The following are other issues in terms of management and operation of the Nile River tourism:

Consolidation of the Nile cruise environmental management

- Cooperation with public services according to their capability;
- Necessity of continuous monitoring and assessment for environmental improvement;
- Consolidation of institutional framework such as regulations and guidelines with necessary expert allocation;

- Promotion of environmental awareness for crews and tourists of water transportation; and
- Necessity of broad cooperation with other sectors, such as urban, agriculture, and industry, to prevent pollution of the Nile River's natural environment, as these sectors could be sources of a far greater magnitude of pollution than those by cruise ships.

The following are not direct issues to be covered by this study; however, they are very important and inevitable for the cruise tourism to tackle constraints in order to achieve a safe and comfortable cruise tour. Major issues including subjects that have already been pointed out in the past, are also indicated below in terms of cruise tourism development in a broad sense.

Improvement of river transportation control management

To improve navigation control and management, the following actions are needed.

- Necessity of proper traffic regulations and traffic control system at berth areas and barrages;
- Necessity of navigational support systems for cruise ship operation, especially counter measures to solve low level water of the Nile River in winter and appropriate communication measures such as voice telecommunication, data transmission and meteorological information;
- Consolidation of sufficient fire safety system and safety regulations in berthing areas;
- Necessity of introducing a zone management system among all water transportation modes, such as cruise ships, ferry boats, river taxis, and recreational boats like Felucca, in the Nile River; and
- Installation of channel navigational aid system, such as lighting beacons and buoys.

And to improve security control and management, the following actions are needed.

- Formulation of security system for passengers to guard against crimes, and emergency system (fire, accidents, etc.) and
- Consolidation of regulatory measures to prohibit inappropriate berthing, such as multi-parallel berthing.

Formulation of Nile Cruise related industry

- Diversification of [Nile Cruise](#) Tourism such as introduction of day-cruise, special theme cruise (ecotourism-cruise, casino-cruise, convention cruise, etc),
- Cruise ship service industry such as laundry service and commodity supply,
- Land transportation connecting to destinations or other areas and
- Information and organization for [Nile cruise](#) tourism.

Formulation of the Nile River environmental information system

- Provision of inventory for basic information on the natural environment of the Nile River, such as bio-diversity, endemic flora and fauna, etc., through several scientific research between Qena and Luxor and Aswan of the Nile,
- Contribution to nature tourism, such as eco-tourism on the Nile providing information on natural tourism resources and
- Contribution to establishment of environmental management zoning to protect natural resources in terms of utilization of the Nile River tourism.

Institutional arrangement for cruise tourism with integration and coordination

- Formulation of inter-governmental coordination among all related agencies, and
- Specification of responsibilities and authority over river management.

2.4 Outline of the Project

2.4.1 Development Framework for Cruise Tourism Facilities Improvement

(1) Cruise ship development target

This section aims at setting the number of cabins (rooms) of cruise ships required in 2012 based on the regional development framework.

Conditions for target setting

The target number of cabins has been estimated by reviewing current studies (1990 and 1999) and related information on future target numbers of cruise ships mentioned in the previous section. Although major consideration for the target setting is shown below, detailed studies are needed for decision-making of optimum target.

- Necessity of setting the number of ships in relation to development capacity considering (a) gradual and possible improvement or development to solve the problems of existing berthing capacity and its safety and operational efficiency, (b) formulation of environment for cruise ship navigation and operation; and (c) consideration of increase in other river transportation facilities such as day-cruise ships,
- Necessity of strict environmental protection, especially in Lake Nasser, and
- Necessity of substitute development of accommodation facilities requirement in total.

Target number of hotel guests, guest-nights and ships

Based on above conditions and several assumptions, the target number of guest nights is calculated, as shown in Table 2.10.

Table 2.10 Target Numbers of Cruise ship Accommodation in Upper Nile

	2002	2007	2012	2017
Hotel Guest (million)	0.76	0.85	0.94	1.04
Hotel Guest Nights (million)	3.8	4.2	4.7	5.2
Share of Total Guest Nights (%)	46%	36%	28%	24%
Number of ship	Luxor- Aswan	225	250	275
	Lake Nasser	5	7	10
	Total	230	257	285
			315	

Note: refer to Table 2.10 (a).

Table 2.10 (a) Correlation coefficient

Occupancy Rate	0.6
Guests per cabin	1.5
Length of stay in all phases	5.0
Cabins per ship in Nile River	50
Cabins per ship in Lake Nasser	60

Source: JICA Study Team

(2) Berth facilities development target volume

Target numbers of berthing slots

According to the estimations described above, the target numbers of berthing slots are calculated as shown in Table 2.11. When the target numbers are estimated, the following conditions are considered:

- To develop and improve single parallel berth facilities with adequate buffer, considering safe navigation and berthing;
- To fill the gap between existing demand and adequate berthing by a temporary measure of parallel berthing in the early phase; and
- To consider the function of berthing as serving not only cruise ships but also other river

transportation modes, such as day cruise ships, in terms of future needs.

Table 2.11 Target Numbers of Berthing Slots

		2002	2007	2012
Number of berthing slots	Cruise ship	230	257	285
	Day cruise ship	3	8	15
	total	233	265	300

Note: Refer to Table 2.11 (a).

Table 2.11 (a) Day-cruise ships per cruising ship

	2002	2007	2012
Day-cruise ships per cruising ship	0.1%	0.3%	0.5%

Source: JICA Study Team

Distribution of target numbers of berthing slots in Upper Nile

According to the estimations described above, the distribution of target numbers of berthing slots is shown in Table 2.12. During estimation, the following conditions are considered.

- To include the numbers or related targets proposed by other development plans in conjunction with berth facilities;
- To disperse berth facilities development pressure to other potential areas thereby preventing concentration on major destinations (Luxor and Aswan), so as to secure safe and comfortable embarkation;
- To secure major suitable berthing slots for night-stay with limited night navigation^{*};
- To ensure adequate places to berth and visit tourist sites;
- To introduce the temporary measure of parallel way of berthing in the early stage in order to fill the gap between demand and capacity; and
- To provide adequate development type for berth facilities taking account of environmental conditions and scale of development.

^{*} It is considered that shipson the waterway at night time, in transit to their final destinations because of tour itinerary or other reasons are excluded from the estimation of required facilities, and those ships are equipped with safe navigation system at night.

Table 2.12 Required Numbers of Berthing Slots

Location of Berthing Slots		2002	2007	2012
Nile River	Qena-Dendera	(30)	(30)	20
	Luxor City	(62)	(63)	39
	El Toad/Luxor	(10)	(10)	25
	Esna City	(20)	(20)	20
	El Kab	–	–	5
	Edufu City	(20)	(22)	37
	Gebel el Silsila	–	–	5
	Kom Ombo	(14)	(14)	21
	Aswan New City	–	20	32
	Aswan City	(51)	(52)	54
	sub-total	207	231	258
Lake Nasser	High Dam Port	(2)	1	1
	Pier to Kalabsha	1*	–	–
	Dakkha/Wadi	–	1	1
	Amada	–	1	1
	Qasir Ibrim	–	1	1
	North Kohr Toughka	–	–	1
	North Abu Simbel	–	1	3
	Abu Simbel	(2)	1	1
	Sub-total	4	6	9
Total		211	237	267

Note: Figures in parentheses indicates estimation by multiple parallel berthing

* means small boats pier development inland of Kalabsha Island.

Refer to Table 2.12 (a).

Table 2.12 (a) Total numbers exclude ships in-transit on the river and lake

		2002	2007	2012
Ship in-transit to each destination on the Nile River and Lake Nasser	Q/Luxor-Aswan	21	26	30
	Lake Nasser	1	2	3
	Total	22	28	33
(Share to total ships)		9%	10%	10%
Ships needing berth facilities		211	237	267
Grand total		233	265	300

Source: JICA Study Team

2.4.2 Project Components

(1) Development of berth facilities

Hierarchical development role and function

In order to enhance the function and role of berth facilities, three types of facilities development are introduced according by level of tourist activities in the destinations of cruise tours as follows:

Type A: Major station (in gateway city, urban amenity and cruise services are necessary) Type

B: Sub-station (in tourist towns and other accommodation bases with limited service) Type C:

One-stop station (in tourist spots with historical resources without cruise services)

Table 2.13 Development Type and Berth facilities Required by Level

Type	Role & Function	Berth facilities Type	Utilities	Visitor Facilities
Type A	Major station for cruise ships - To be a riverfront-base to dock at a tourists can stay at a tourist town with attractions - To supply basic commodities for cruise ships - To function as traffic terminal between cruise ship and land transportation - To function as a water-oriented recreational activity base - To provide visitors with amenity	Concrete structure & rock-fill embankment - To prepare open space for visitors - To equip with utility service	- Electricity/telecommunication - Water supply - Fuel supply - Sewerage collection - Solid waste collection - Fire hydrant	- Street furniture (Lighting, bench, etc.) - Telephone booth - Toilet - Kiosk/Information booth - Souvenir shop - Coffee shop - Security station - Parking
Type B	Sub station for cruise ships - To be a temporary base to stay and access historical attractions and other facilities - To function as traffic node between ship and land transportation - To provide visitors with basic service facilities - To function as water-oriented recreational activity base	Iron structure pier - To prepare the ship for visitors - To equip with limited utility service - To take account of construction method to mitigate environmental impact	- Electricity/telecommunication - Water supply	- Street furniture (lighting, bench, etc.) - Telephone booth - Toilet - Security station - Parking
Type C	One-stop pier for cruise ships - To be an access point for tourist attractions behind river-front - To prepare a port for one-stop place for cruise ships	Iron structure pier - To prepare the ship for visitors	- Electricity/telecommunication	- Street furniture (lighting, bench, etc.) - Telephone - Security station

Source: JICA Study Team

Development structure type

On the other hand, conforming to the cruise ship's dimensions, a typical berth facility slot is to be designed in scale and structure alongside the manner of berthing, with the following considerations:

- To secure a suitable buffer for the embankment of the Nile River considering the direction of river current and the speed and direction to navigate boats safely and with ease (requirement of length per berthing slot = 1.5 x length of ship);
- To consider physical limits (width and depth of the Nile River) to be able to navigate ships and boats safely;
- To consider mitigation of environmental impact by facilities development;
- To develop the facilities taking account of environmental design and economic measures; and
- To provide various types of facilities depending on the site condition and service function for tourists.

Three structural types of development are as follows:

- Structure 1: Wharf embankment type of berth facilities by concrete structure
- Structure 2: Landing pier type of berth facilities by iron structure
- Structure 3: Floating bridge type of berth facilities by mixed-material structure

Figure 2.4

Wharf Embankment Type of Development / Improvement (Type A)

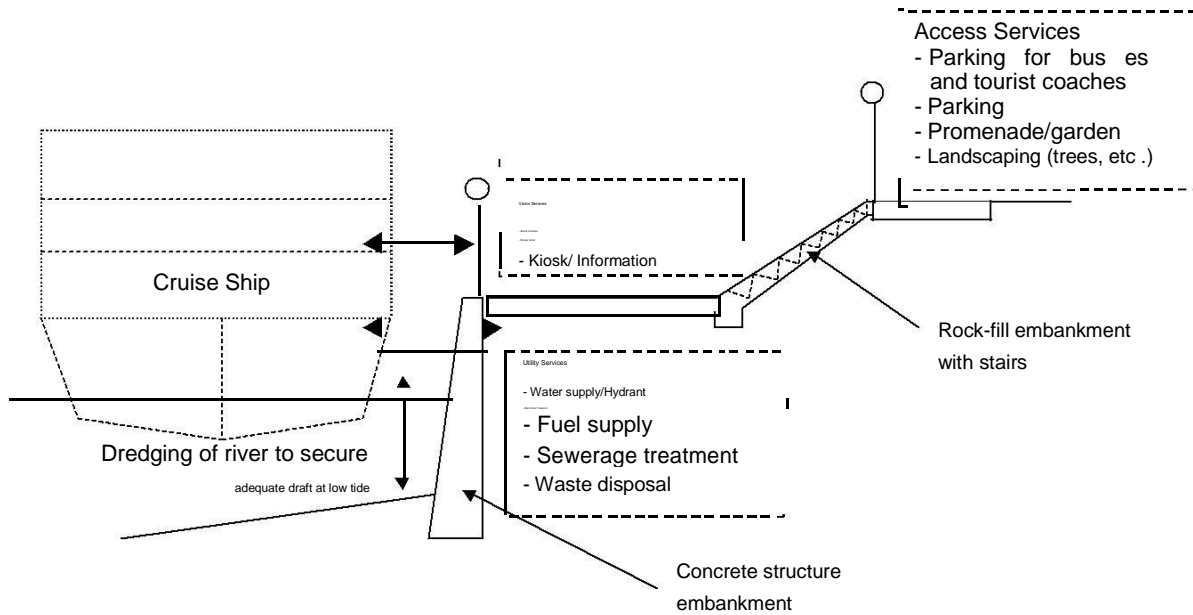
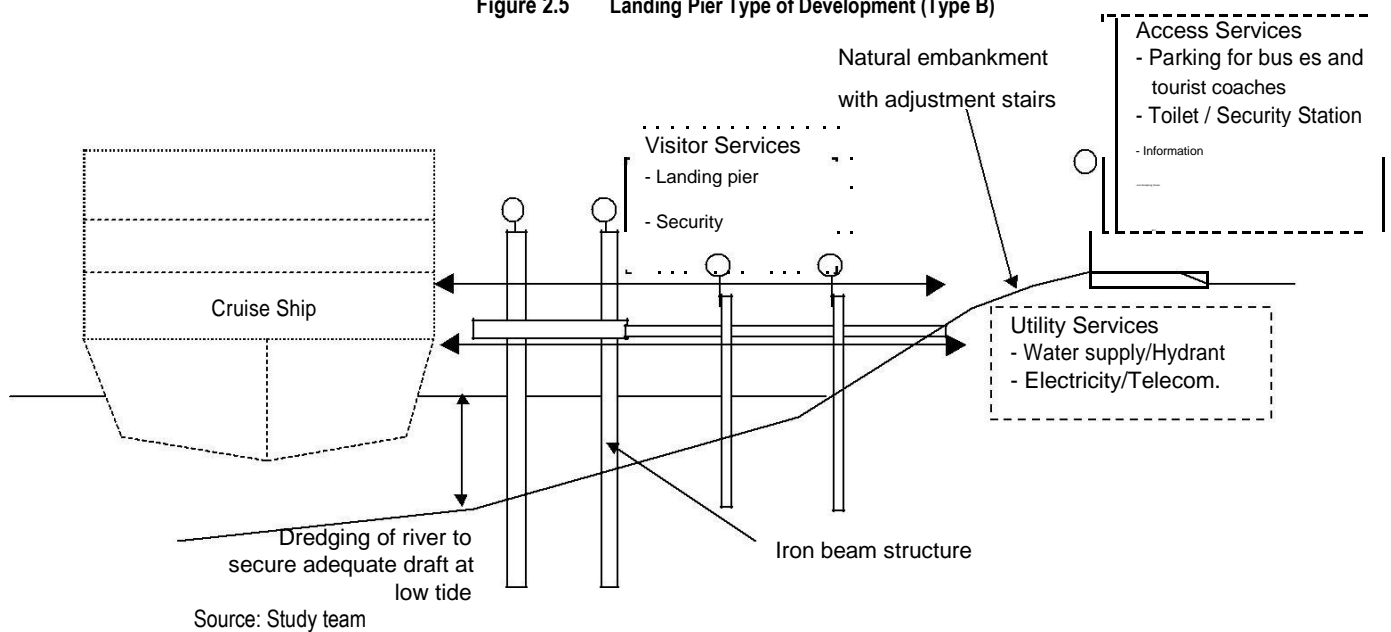


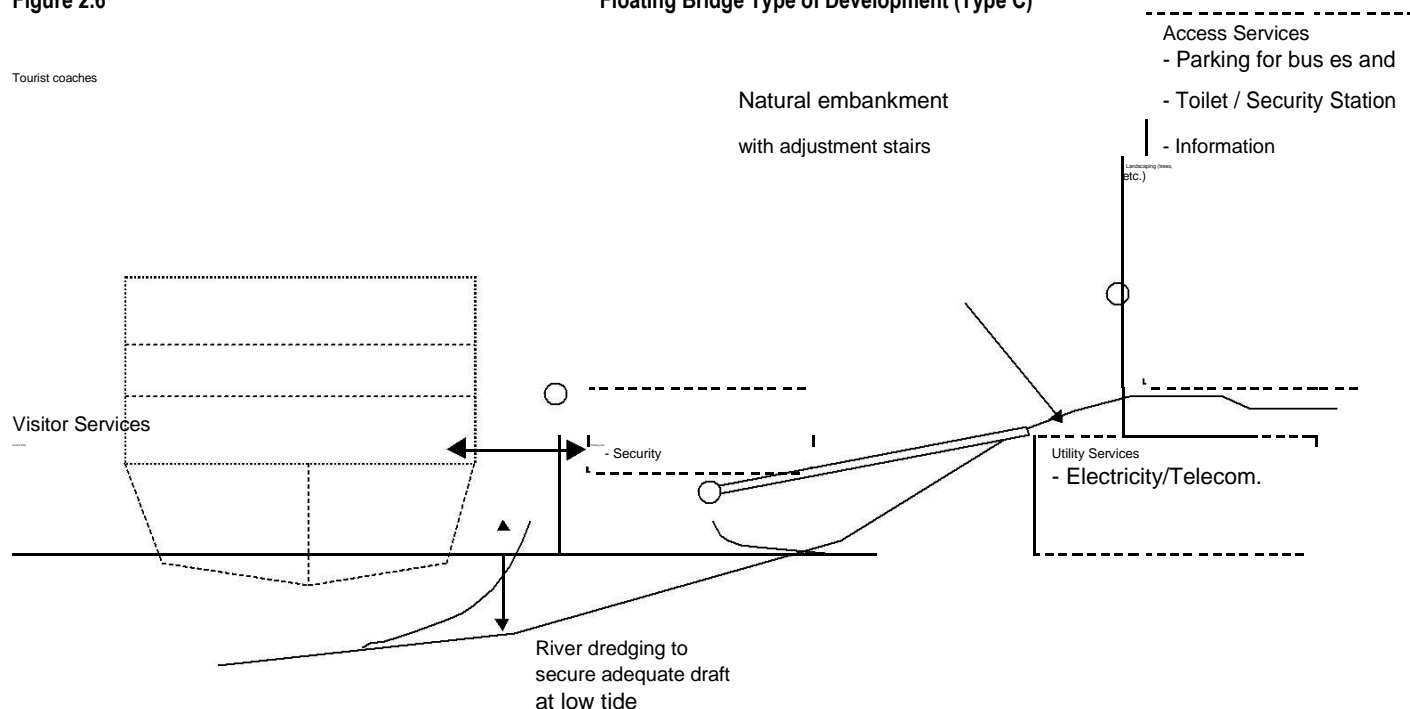
Figure 2.5 Landing Pier Type of Development (Type B)



Source: Study team

Figure 2.6

Floating Bridge Type of Development (Type C)



Source: JICA Study Team

Development degree type

According to the existing conditions and development framework previously mentioned, the development degree of berth facilities can be classified into the following three types:

- Improvement of existing berth facilities to upgrade them;
- Expansion of existing berth facilities to meet demand and improve navigational environment; and
- New development to meet demand taking account of product diversification and prevention of concentration on major destination places.

Development component

According to type of berth facilities, the development components are classified as follows, which are applicable to site conditions at the Nile River and Lake Nasser:

Table 2.14 Development Components for Berth facilities

Type	Major development components	Improvement of berth facilities			Expansion & New Development
TYPE A	Wharf embankment	---	---	---	A4
	Utility services for cruise ships	A1	---	A3	
	Visitor service facilities	---	A2		
TYPE B	Landing pier facilities	---	---	---	B4
	Limited utility service	B1	---	B3	
	Visitor service facilities	---	B2		
TYPE C	Floating bridge	C1	---	C3	C4
	Visitor service facilities	---	C2		

Source: JICA Study Team

(2) Improvement plan for each site

The improvement plan for each site is proposed by type and degree of development applied to each site, including those with and without berth facilities, taking account of existing conditions and desirable future function. For Nile River and Lake Nasser, 17 and 8 projects are proposed respectively, as shown in Table 2.15.

Table 2.15 Proposed Berth facilities Improvement Plan in the Upper Nile Area

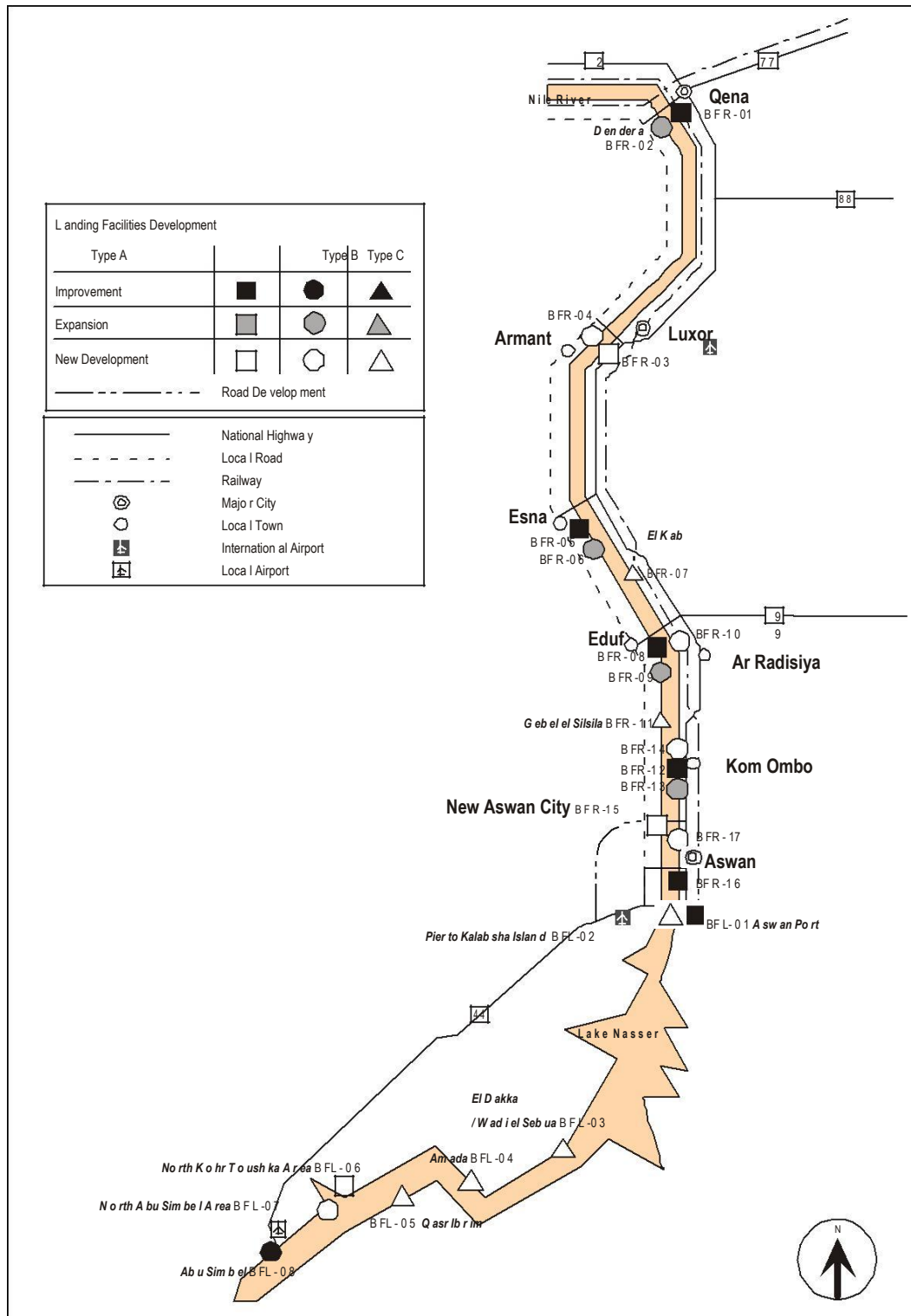
Area	Project code	Location	Existing facility status	Improvement Plan by Type			Reference
				A	B	C	
Qena Governorate	BFR-01	Qena City	Newly developed		-	-	Type A: Berth facilities with utility services and amenities for visitors by wharf embankment type
	BFR-02	Beside of above area	No facilities	-		-	
Luxor City	BFR-03	Luxor west bank/El Toad	No facilities	-		-	
	BFR-04	Luxor east bank/El Toad	Planned		-	-	
	-	Luxor east bank	Existing Berth	-	-	-	
Qena Governorate	BFR-05	Esna City	Existing Berth		-	-	Type B: Berth facilities with limited utilities and limited visitor facilities by landing pier type
	BFR-06	Beside of above area	No facilities	-		-	
Aswan Governorate (Nile River)	BFR-07	El-Kab area	No facilities	-	-		
	BFR-08	Eduf City west bank	Existing Berth		-	-	
	BFR-09	Beside of above area	No facilities	-		-	Type C: Floating bridge type limited utilities
	BFR-10	Eduf City east bank	No facilities	-		-	
	BFR-11	Gebel el Silsila	No facilities	-	-		
	BFR-12	Kom Ombo east bank	Existing Berth		-	-	
	BFR-13	Beside of above area	No facilities	-		-	
	BFR-14	Kom Ombo east bank	No facilities	-		-	
	BFR-15	Aswan New City	Resort city planned		-	-	
	BFR-16	Aswan east bank	Existing Berth		-	-	
	BFR-17	Aswan new east bank	No facilities	-		-	
Aswan Governorate (Lake Nasser)	BFL-01	Aswan High Dam Port	Existing Berth		-	-	* Inland pier beside lake **Kalabsha/Beit el Wadi
	BFL-02	Landing pier* to the island**	No facilities	-	-		
	BFL-03	Dakka/El Sebua	No facilities	-	-		
	BFL-04	Amada/El Derr Penut	No facilities	-	-		
	BFL-05	Qasr Ibrim	No facilities	-	-		
	BFL-06	North Kohr Tushka	No facilities		-	-	
	BFL-07	North Abu Simbel	No facilities		-	-	
	BFL-08	Abu Simbel	Existing Berth	-		-	

Note: = New development, = Additional expansion, = facilities improvement, - = not necessary, not existing

Source: JICA Study Team

Table 2.16 shows the required length of berth facilities for each of the 25 projects.

Figure 2.7 Proposed Berth Facilities Improvement Plan in Upper Nile



Source: JICA Study Team

Table 2.16 Length of Berth facilities Required

Development zone	Area	Project code	Location	Classification	Total length (km)
Nile River	Qena Governorate	BFR-01	Qena City	A1	1.7
		BFR-02	Beside of above area	B4	0.7
	Luxor City	BFR-03	Luxor west bank/El Toad	B4	1.2
		BFR-04	Luxor east bank/El Toad	A4	3.0
		-	Luxor east bank	-	(3.5)*
	Qena Governorate	BFR-05	Esna City	A3	1.3
		BFR-06	Beside of above area	B4	1.1
	Aswan Governorate	BFR-07	El-Kab area	C3	0.6
		BFR-08	Eduf City west bank	A3	0.8
		BFR-09	Beside of above area	B4	1.2
		BFR-10	Eduf City east bank	B4	1.7
		BFR-11	Gebel el Silsila	C4	0.6
		BFR-12	Kom Ombo east bank	A3	0.5
		BFR-13	beside of above area	B4	0.6
		BFR-14	Kom Ombo east bank	B4	1.0
		BFR-15	Aswan New City	A4	3.9
		BFR-16	Aswan east bank	A3	3.0
		BFR-17	Aswan new east bank	B4	3.5
	Sub-total				
Lake Nasser	Aswan Governorate	BFL-01	Aswan High Dam Port	A2	0.7
		BFL-02	Landing pier* to the island**	C4	0.1
		BFL-03	Dakka/El Sebua	C3	0.1
		BFL-04	Amada/El Derr Penut	C3	0.1
		BFL-05	Qasr Ibrim	C3	0.1
		BFL-06	North Kohr Tushka	A4	0.5
		BFL-07	North Abu Simbel	A4	0.4
		BFL-08	Abu Simbel	B2	0.1
Sub-total					2.1
Total					28.5

Note: Classification is referred to Table 2.14

Source: JICA Study Team

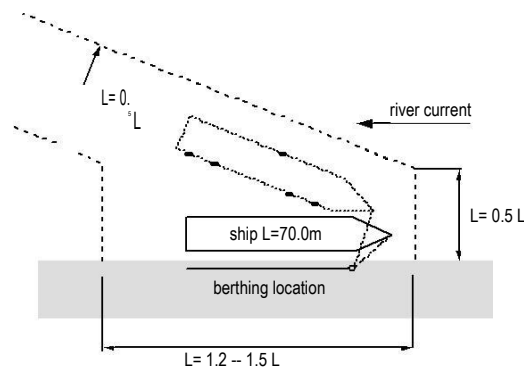
(3) General planning conditions and improvement guidelines

General planning conditions and guidelines for the improvement plan are described hereafter. It is necessary to give careful consideration to the natural and physical conditions of berthing sites, which are composed of several facilities including embankment, utilities and visitor facilities, when they are improved or developed. The following are indicated as planning conditions or guidelines for the improvement plan.

Berthing slots

In order to address traffic congestion of ships and to secure their safety and efficiency, berthing slot should have appropriate length and intervals between ships, taking account of river current and number of slots. The desirable dimension of berthing slot is indicated as follows: for berths with over 4 slots, the length of slot should be 1.5 times the length of ship, with single parallel berthing.

Figure 2.8 Berthing Slot Dimensions for Cruise Ship

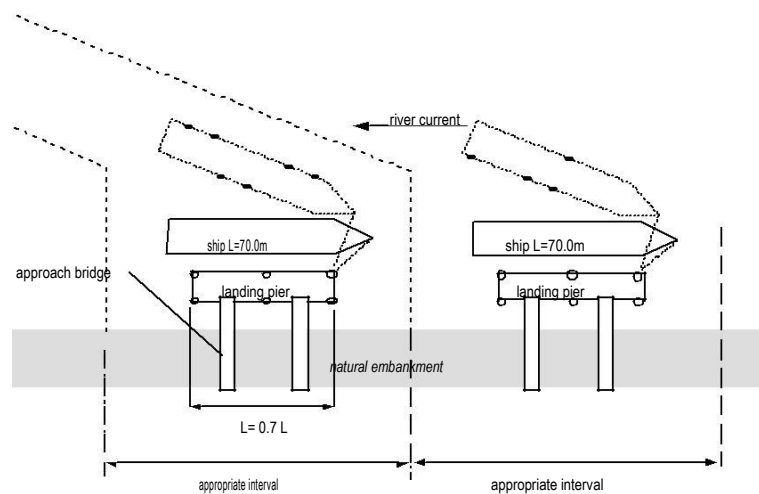


Source: JICA Study Team

Landing pier type berth facilities

Berth facilities of the landing pier type with iron structure has to take into account the mitigation of environmental impact and depth of water required to float a ship (draft). This type can be built at the embankment area in order to sustain a natural landscape. It is difficult to build a hard embankment surface due to the physical condition of the Nile River. The proposed dimensions that should be elaborated in further engineering study can be illustrated as follows.

Figure 2.9 Proposed Dimensions of Landing Pier Type Berth facilities



Source: JICA Study Team

Utilities of berth facilities

Berth facilities should be equipped with utilities such as electricity, water, and fuel, for use of ships and to control emission of pollutants from ships, considering mitigation of environmental pollution to the Nile River. The environmental functions of these utilities are as follows:

- To prevent periodic contamination of drinking water of ships;
- To minimize emission from diesel engines by the ready supply of electricity needed by ships in berth;
- To prevent ships from discharging sewerage and wastewater, such as high concentration detergents, into the Nile River or Lake Nasser;
- To prevent ships from discharging solid waste by providing a disposal system in the berth facilities; and

- To prevent oil and fuel spills by providing a disposal system in the berth facilities.

Within a framework principle that utility services in the berthing site play an intermediary role in management until they are connected to public service, in case of “Development Types A and B,” utilities can have adequate scale and capacity as a relay station according to each site condition.

On the other hand, beyond berth facilities areas, there would be a need to provide a network or system to connect utilities to sites so that waste could be discharged from ships. For utilities out of berth facilities area, three cases would be possible alternatives in consideration of the circumstance in each site. Refer to “[Nile Cruise](#) Environmental Management Program”.

Visitor facilities

Visitor facilities aim at serving tourists or visitors who use not only cruise ships but also tour buses or other modes of transportation. These facilities also provide information on attractions, tickets and rest places to visitors enjoying recreational activities such as “Felucca” or recreational boats. In order to meet these needs, the necessary components for visitor facilities can be formulated, and following the basic considerations below:

- To organize and manage various visitor traffic , including those of cruise ships, shuttle transportation to historic sites, excursion buses and others, by separation of each traffic flow or by time control, adequate parking measures, etc.;
- To provide adequate information facilities for visitors in order to guide them in the sites and the surrounding attractions, including ticketing service for other facilities such as recreational boats and coaches;
- To improve refreshment facilities, such as restaurants and tea shops, or provide them in suitable places for visitors, especially land excursion tourists, in consideration of existing condition;
- To provide or improve souvenir shops;
- To establish design codes or guidelines taking into account harmonizing landscape with surroundings, especially antiquity sites;
- To provide tenant spaces for above facilities in which local industries can participate;
- To create a comfortable environment with shade-trees and suitable alcoves to serve as rest places on the Nile River waterfront; and
- To provide security system with tourist police and other emergency aids.

2.5 Project Cost Estimate and Implementation

2.5.1 Project Cost Estimate

(1) Assumptions

The following assumptions have been made for cost estimation:

- Project cost is estimated based on market prices in November 1999 and inflation is not taken into account for cost and revenue estimate.
- Cost components consist of Direct Construction, Design and Supervision, Overheads Profits, excluding land acquisition costs and taxes.
- Foreign exchange rate as of the end of November 1999 is used during the whole project life as follows:
US\$ 1.00 = LE 3.40, LE 1.00 = Japanese Yen 30.00
- Target year is 2012 and the project is designed to meet the demand in 2012.

(2) Project cost

The investment cost of the project includes the development costs for the facilities as shown in Table 2.17. Project cost amounts to LE 1,354 million, excluding the costs for contingency, land

acquisition, all taxes and commercial facilities such as restaurants and souvenir shops. Total cost of the project as a package of sub-projects amounts to LE 1,354 million. This total cost is divided according to the time frame for project implementation (urgent action, short term and medium term), considering the scale, effect and other development program. Table 2.18 hereafter in detail.

- Urgent-action project cost	:	70 million LE (5%)
- Short-term project cost	:	678 million LE (50%)
- Medium-term project cost	:	606 million LE (45%)
Total project cost	:	1,354 million LE (100)

Note: Urgent Action projects are to be implemented within 2 years.
Short-term projects are to be implemented within 3 - 7 years.
Medium-term projects are to be implemented within 8 - 12 years.

Table 2.17 Facilities required for Investment

Category	Type of Facilities	Facilities included in project cost
Tourist facilities	Site sign and information	
	Public toilet and rest place	
	Ticket booth/security booth	
	Restaurant/coffee shop	
	Souvenir shop	
	Visitor parking	
	Pedestrian improvement	
Berthing facilities	Wharf embankment	
	Utility facilities	
	River dredging*	

Source: JICA Study Team

2.5.2 Project Implementation

(1) Implementation Schedule

The implementation schedule of the sub-projects depends on its nature and scale, readiness for implementation, etc. Table 2.19 shows a tentative schedule for the sub-projects.

(2) Implementation Agency

Major concerns for the implementation of this project are as follows:

- To coordinate the whole development area (Nile River and Lake Nasser) spanning the three governorates of Qena, Luxor City, Aswan;
- To implement the project smoothly by several agencies related to tourism development and water use with environmental consideration, from the central governments and agencies to the local level due to the wide range of character of this project; and
- To take into account the possible participation of the private sector according to its role and function on this project, from project implementation to operation.

Role of government and full integration and co-ordination

In order to implement the project smoothly and efficiently as an integrated cruise tourism facilities improvement in Upper Nile, it is recommended to formulate an organizational system in which several agencies will take charge of management of several activities on the utilization and cruise tourism development of the Nile River and Lake Nasser.

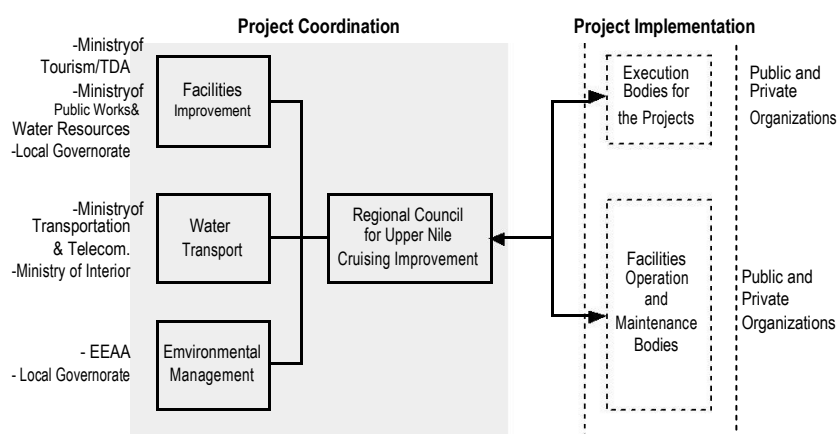
A suggested system comprising different agencies for the integrated cruise tourism facilities improvement is shown in Figure 2.12. Also, major matters to be coordinated by each agency are indicated in Table 2.20.

The projects would require initial investment from the public sector. The main functions of the project unit are summarized as follows:

- Coordinate line agencies and different levels of government involved in implementing the project;
- Monitor its progress; and
- Provide technical and financial assistance.

The proposed organization illustrated above should discuss the different issues of the project concerned and to take necessary actions for effective implementation of the project.

Figure 2.10 Organization of Coordinating Agencies for Integrated Cruise Tourism Facilities Improvement



Source: JICA Study Team

Table 2.20 Delineation of Responsibility of Coordinating Agencies for Integrated Cruise Tourism Facilities Improvement

Improvement activities		Ministry and Agency	MOT/ TDA	MOTR	MOPW WR	MOALR	SCA	MOI	EEAA	Local Gov
Water Transport	Navigational control system		-		-	-	-	-	-	
	River dredging					-	-	-		
	Cruising operation system				-	-	-	-	-	
Improvement of berth facilities	Berthing embankment facilities							-		
	Utilities support system			-		-	-	-	-	
	Tourist service facilities			-	-			-	-	
	Security system (fire and crimes)			-	-	-	-		-	
Facilities environmental management	Environmental equipment for ships				-	-	-	-		-
	Sustainable improvement of river banks			-			-	-		-
	Design control for improvement			-	-	-		-		-

Note: = major responsibility, = cooperation or coordination

MOTR = Ministry of Transportation, MOPWWR = Ministry of Public Works and Water Resources, MOALR = Ministry of Agriculture and Land Reclamation, SCA = Supreme Council of Antiquity, EEAA = Egyptian Environmental Affairs Agency

Source: JICA Study Team

Private-sector participation for Upper Nile cruise improvement

It should be considered that adequate implementation bodies would depend on the character of location to be developed, whether urban, rural or remote area in front of historical areas, and also on the character of project in terms of capability of private or public support. The improvement project can be classified by each type of berth facilities, as follows:

According to the type of berth facilities mentioned previously, development character can be classified as follows:

Type A: This type of large-scale development or improvement with urban amenities and utility services for cruise ships in front of major gateway cities could be suitable for private sector participation or public-private partnership.

Type B: This type of medium-scale development or improvement with utility services, which faces a tourist town or a new resort development area, could have the same possibility mentioned above.

Type C: This small-scale development or improvement of a tourist sightseeing area would be limited to private sector participation.

This project can be divided into the following components, which are suitable for direct implementation.

- Construction: (berth facilities, amenities, utilities)
- Maintenance and operation: (same as above category)
- Utilities (water supply, sewerage and solid waste, waste oil discharge in cooperation with public sector)
- Supplemental service (laundry service, commodities supply, etc. for cruise ships)

In response to above character of the project, suggested implementing bodies of berth facilities development are shown in Table 2.21.

Table 2.21 Suggested Implementing Bodies by Berth facilities Development Type

Berth facilities development type	Development and construction	Maintenance/ operation	Utilities support	Hotel operation support
Type A (Major station)	Private + Public	Private sector	Private sector	Private sector
Type B (Sub-station)	Private + Public	Private sector	Private sector	Private sector
Type C (One-stop pier)	Public sector	Private (consignment)	-	-

Source: JICA Study Team

2.6 Financial and Economic Evaluation

2.6.1 Financial Evaluation

(1) Assumptions

Financial viability of the project is examined under some assumptions as follows:

Project package

Twenty-five proposed projects are grouped into 10 project packages based on the location of berths as shown in Table 2.22. Financial viability is individually examined for the 10 packages. The existing berth of the east bank of Luxor is not included in the packages, because no additional development is proposed in the project.

Table 2.22 Ten Project Packages

Governorate	Project package	Location	Project
			Code
Qena Governorate	1	Qena-Dendera	BFR-01 Existing improvement-Qena City
			BFR-02 Expansion-Qena City
Luxor City	2	El Toad/Luxor	BFR-03 New development- west bank/El Toad
			BFR-04 New development- El Toad
Qena Governorate	3	Esna City	BFR-05 Existing improvement-Esna City
			BFR-06 Expansion-Esna City
Aswan Governorate (Nile River)	4	El Kab	BFR-07 New development-El-Kab
	5	Eduf City	BFR-08 Existing improvement-Eduf City
			BFR-09 Expansion-west bank Eduf City
			BFR-10 New development-east bank Eduf City
	6	Gebel el Silsila	BFR-11 New development-Gebel el Silsila
	7	Kom Ombo	BFR-12 Existing improvement-Kom Ombo
			BFR-13 Expansion-east bank Kom Ombo
			BFR-14 New development-east bank Kom Ombo
	8	Aswan New City	BFR-15 New development-Aswan New City
	9	Aswan City	BFR-16 Existing improvement-Aswan City
Aswan Governorate (Lake Nasser)	10	Lake Nasser	BFR-17 New development-east bank Aswan
			BFL-01 Existing improvement-High Dam Port
			BFL-02 New development-Pier for Kalabsha
			BFL-03 New development-Dakka/Wadi
			BFL-04 New development-Amada
			BFL-05 New development-Qasr Ibrim
			BFL-06 New development-North Kohr Toughka
			BFL-07 New development-North Abu Simbel
			BFL-08 Existing improvement-Abu Simbel

Source: JICA Study Team

Construction cost by project package

Table 2.23 shows the development cost by development term and the share of civil works cost and utility development cost. Total development cost is estimated at LE 1,354 million, of which LE 70 million, LE 678 million and LE 606 million are for urgent action, short-term development and medium-term development, respectively. Cost for civil works shares 89 % of the total development cost.

Table 2.23 Initial Development Cost by Development Term

(Unit: LE million)

Project package	Site area (ha)	Urgent (2001-2002)	Short term (2003-2007)	Medium term (2008-2012)	Total cost	Share in total cost	Development cost share	
							Civil work	Utilities
1 Qena-Dendera	6.3	15	52	0	67	5%	55%	45%
2 El Toad/Luxor	7.8	11	148	137	296	22%	93%	7%
3 Esna City	6.3	8	15	60	83	6%	87%	13%
4 El Kab	1.6	0	0	18	18	1%	100%	
5 Eduf City	11.6	7	128	44	179	13%	90%	10%
6 Gebel el Silsila	1.6	0	0	18	18	1%	100%	
7 Kom Ombo	6.6	8	34	57	99	7%	89%	11%
8 Aswan New City	10.0	0	144	152	296	22%	93%	7%
9 Aswan City	16.9	14	113	120	247	18%	87%	13%
Sub-total	80.6	63	634	606	1,303	96%	89%	11%
10 Lake Nasser	3.0	7	44	0	51	4%	95%	5%
Ground total	83.6	70	678	606	1,354	100%	89%	11%

Source: JICA Study Team

Implementing body

The institutional arrangements for the implementation of the project have variously been proposed in the previous section. In order to identify the financial viability of each project package, however, it is assumed that an Integrated Company will implement each project package in the evaluation. And the financial performances of 10 Companies are examined.

Revenue

Revenue sources of the project for the Company are assumed to consist of (1) berthing charges of cruise ships, (2) utility charges to cruise ships, (3) berth rents of leisure boats, (4) developed land rents for shops and restaurants, and (5) parking charges of vehicles.

Demand (number of night-stay and stopover of cruise ships, number of visitors from river and land, and number of vehicle s) is estimated by project package based on the development framework as shown in Table 2.24. After 2012 it is assumed that the demand will be constant for the financial evaluation.

The rates of the charges of revenues are assumed as shown in Table 2.25. It is assumed that the Company will not own and operate shops and restaurants but develop the land and lease it to the private sector. Meanwhile, parking is assumed as operated by the Company.

Table 2.24 Number of Berthing Ships, Visitors and Vehicles per Day in 2012

Project package	No. of berthing ships per day		No. of visitors per day		No. of vehicles per day
	Night stay ¹⁾	Excursion ²⁾	By ship ³⁾	By vehicle ⁴⁾	
1 Qena-Dendera	20 (22)	31	2,970	1,300	120
2 El Toad/Luxor	25 (28)	39	3,780	190	20
3 Esna City	20 (22)	31	3,105	1,300	120
4 El Kab	5 (6)	8	540	930	90
5 Eduf City	37 (41)	57	5,805	1,860	170
6 Gebel el Silsila	5 (6)	8	540	370	30
7 Kom Ombo	21 (23)	32	3,240	1,860	170
8 Aswan New City	32 (36)	50	4,860	190	20
9 Aswan City	54 (60)	84	8,100	1,860	170
10 Lake Nasser	9 (12)	17	1,620	830	80
Total	228 (256)	357	34,560	10,690	990

Note: 1) Figures in parentheses include the number of ships in-transit (refer to Table 2.12)
2) Cruise ship will stop at two berths per day excluding the berth for night stay and operating ratio is estimated at 70%.
3) Cruise ship passenger: Room occupancy rate is 60% and average number of passengers is 1.5 person per room
4) Number of visitors by vehicle is estimated based on the framework of the Upper Egypt Tourism

Development Source: JICA Study Team

Table 2.25 Assumptions on Revenue Sources and Rates of Charge

Revenue source	Rate of charge
1. Berthing charge	LE 700 per ship per night of stay LE 400 per ship per stop for sightseeing excursion ¹⁾
2. Utility service for sewerage and waste disposal	LE 10 per room of cruise ship per day ²⁾
3. Berth rents of leisure boats	LE 20 per ship per day
4. Land rents to shops and restaurants	LE 5 per m ² per month
5. Parking charge of vehicles	LE 5 per vehicle

Source: JICA Study Team

Operation and maintenance costs

Operation and maintenance cost of the project for the Company consists of (a) land rent (b) operation and maintenance cost of utilities and disposal cost of wastes of the utility services and (c) operation and maintenance cost berth and public areas. Based on the available information, expenditure is assumed as shown in Table 2.26.

Table 2.26 Assumptions on Operation and Maintenance Costs

O & M costs	Rate of expenses
1. Land rent	LE 3 per m ² per year
2. O & M costs for facilities including payment for the charges for sewerage and waste disposal	3% of construction cost of facility per year Half of utility services revenue is estimated to be spent as disposal costs of sewerage and waste
3. O & M costs for berth and public areas	1 - 4% of construction costs estimated depend on kind of development type

Source: JICA Study Team

Evaluation period

Average life period of the facility is assumed to be 25 years. Therefore, financial pre-feasibility is examined over the period until 2032. As results of the project implementation, some project packages expect revenue from 2007 during the short-term period and others from 2012 during the medium-term period. The year when the Company will start to receive revenue is assumed as shown in Table 2.27 based on the implementation schedule.

Table 2.27 Year of Starting Operation of Facility

Project package	Revenue				
	Berthing charge for cruise ships	Utility service charge	Berthing charge for leisure boat	Land rents for shops & restaurants	Parking charge for vehicles
1 Qena-Dendera	2007	2007	2007	2007	2007
2 El Toad/Luxor	2007	2007	2012	2012	2007
3 Esna City	2007	2007	2007	2007	2007
4 El Kab	2012	No service	No service	2012	2012
5 Eduf City	2007	2007	2007	2007	2007
6 Gebel el Silsila	2012	No service	No service	2012	2012
7 Kom Ombo	2007	2007	2007	2007	2007
8 Aswan New City	2007	2007	2012	2012	2007
9 Aswan City	2007	2007	2007	2007	2007
10 Lake Nasser	2007	2007	2007	2007	2007

Source: JICA Study Team

(2) Financial Evaluation

Table 2.28 shows the financial viability in the following indicators:

- Net cash flow over the project period from 2000 to 2032
- Net Present Value (discount rate at 8%)
- Financial Internal Rate of Return

Cash flows of each project package are prepared from Table 2.29 to Table 2.38 and the integrated cash flow of the project is also prepared in Table 2.39. Interest payment and inflation are not taken into account in the cash flows.

Table 2.28 FIRR and NPV of the 10 Project Packages

Project package		Net cash flow (LE million)	NPV (r=8%) (LE million)	FIRR
Nile River	Qena-Dendera	183	23	11.9%
	El Toad/Luxor	-72	-138	-
	Esna City	159	17	11.9%
	El Kab	30	2	9.9%
	Eduf	216	-22	6.2%
	Gebel el Silsila	27	1	9.3%
	Kom Ombo	130	-2	7.6%
	Aswan New City	33	-98	0.8%
	Aswan City	384	19	9.4%
Lake Nasser Corridor		62	-10	5.6%
Total		1,151	-209	5.2%

Source: JICA Study Team

Financial viability of total development

As shown in Table 2.23, total development cost of the project is estimated at LE 1,354 million over the period from 2001 to 2011. In 2012, when all the projects are scheduled to be completed, total number of cruising ships will be 256. For 256 ships, 11,520 passengers will be expected per day. In 2012 total revenue of the project is estimated at LE 143 million per year, while total operating and maintenance cost is estimated at LE 40 million. Accordingly, annual net cash flow is calculated at LE 103 million in 2012, though the interest payment, inflation and taxes are not taken into account.

Total development cost, including initial investment cost and operation and maintenance cost, is

estimated at about LE 2,380 million over the project period until 2032. That is an average development cost per cruise ship passenger per day of LE 23.

Net cash flow of the project is estimated to accumulate LE 1,151 million, as shown in Table 2.28. Assuming a discount rate at 8%, the Net Present Value (NPV) is a deficit of LE 209 million. The Financial Internal Rate of Return (FIRR) is estimated at 5.2%, which is low for private sector to invest.

Financial viability of project package

FIRRs of each 10 packages vary from 0.8% to 11.9 %. It is noted that the FIRR of 10 packages is not the indicator that shows the order or priority of implementation among them. It indicates the magnitude of requirement for public sector's involvement for financing of the individual project packages. Namely, for the implementation of the project package, which shows low FIRR, financial sources with subsidies from the government should be considered. It is important for the implementation of the project that every project package will be implemented on the proposed schedule when considering the impact of cruise ships on the Nile environment.

In Qena-Dendera, Esna City and Aswan City packages, the facility improvement and expansion plan are included and no new development is proposed. Therefore profitability of those packages are comparatively high. Their FIRRs are 11.9%, 11.9% and 9.4% for Qena-Dendera, Esna City and Aswan City respectively. However they are still low for private sector's profitability to implement the project.

El Kab and Gebel el Silsila are located at rural areas and are new berth developments. Those project packages are proposed as a limited development, namely "floating bridge type development (Type C)". They will not provide utility services and those services need to be provided by other berth facilities. Their development scale is small sharing 1% of total development cost, as shown in Table 2.23. The FIRR is comparatively high at 9.9% and 9.3% in El Kab and Gebel el Silsila respectively. However it is a key factor for the financial performance of these two berths, whether the target number of passenger arrivals will be attained or not. The contribution of the development to local economy will be expected in the area.

El Toad and Aswan New City packages are new developments located in gateway cities. Therefore, they require huge initial investment costs. Each development cost of El Toad and Aswan High City package amounts to 22% of total cost. Their profitability is very low. Luxor City Development Plan and Aswan New City Development Plan are in progress in those cities by UNDP and the Ministry of Housing Utilities and Urban Communities. Under these circumstances, it will be required that the public sector subsidize a considerable part of development cost for these two packages.

External financing

External financial resources such as soft loan with subsidized conditions should also be considered to finance the initial investment cost of the project.

